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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,857	05/31/2001	Ralf Trutschel	10191/1750	3474

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EXAMINER

KIM, CHRISTOPHER S

ART UNIT	PAPER NUMBER
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3752

DATE MAILED: 08/12/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Applicati n No.

09/763,857

Applicant(s)

TRUTSCHEL ET AL.

Examiner

Christopher S. Kim

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-- Th MAILING DATE of this communication appears on th cover she t with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 12-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on March 26, 2003 and June 25, 2003 have been entered.

### ***Response to Amendment***

2. This Office action utilizes line numbers, which includes numbering of blank lines, provided by the applicant when referring to lines in the specification section of the application by line number.

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Drawings***

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "direct injection of a fuel into a combustion chamber of the internal combustion engine" recited in claim 12;

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the "entry plane" recited in claim 12; the "projection" recited in claim 12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: "entry plane" and "projection" recited in claim 12.

### ***Claim Rejections - 35 USC § 112***

6. Claim 19 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites the limitation "the valve seat element includes a spray element...the spray element is fixedly connected to the valve seat element." Applicant has defined the "spray element" as a subcomponent of the "valve seat element." It is not apparent how an element can be fixedly connected to itself.

***Claim Rejections - 35 USC § 103***

7. Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imafuku et al. (4,890,794) in view of Shen et al. (5,878,962).

With respect to claims 12, 13 and 15-22, Imafuku et al. discloses a fuel injector comprising: an energizable actuating element 14; a valve needle 27; a fixed valve seat 48; a valve seat element 9, 55; an orifice 54a,b; a valve closing section 47; a flattened face (downstream end of 45); an outlet orifice (outlet of orifice 54a,b). The entry plane of the outlet orifice (outlet of orifice 54a,b) is arranged such that the entry plane is completely covered by a projection of the flattened face (downstream end of 45) into the entry plane (projection of downstream end of 45 onto orifice 45 at an angle such that the projection completely covers the orifice). Imafuku et al. does not disclose a swirl-producing element. Shen et al. discloses a swirl-producing element 38, 48 upstream of a fixed valve seat 34. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have incorporated the swirl-producing element of Shen et al. to the device of Imafuku et al. to provide a swirl pattern spray.

With respect to claim 14, Imafuku et al. in view of Shen et al. discloses the limitations of the claimed invention with the exception of the ratio. It would have been obvious to one having ordinary skill in the art at the time the invention was made to d/D of approximately 1.5 for optimization dependent of operating criteria, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

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8. Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ren et al. (5,996,912).

Ren et al. differs from what is being claimed in the flattened face diameter  $d$  being greater than the outlet orifice diameter. Ren et al. discloses an outlet orifice diameter  $d_0$  which is greater than the flattened face diameter  $d_f$ . This embodiment is precisely the embodiment applicant discloses in figure 6 and on page 9, lines 8-13 of the current application. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have optimized the values of  $d_0$  and  $d_f$  for desirability dependent on certain applications (applicant's specification, page 9, line 12).

### ***Response to Arguments***

9. Applicant's arguments filed June 25, 2003 have been fully considered but they are not persuasive. Amendments filed June 25, 2003 and March 26, 2003 contain identical arguments.

In response to applicant's argument directed to the drawing objections, applicant first states that the "direct injection of a fuel into a combustion chamber of the internal combustion engine" is adequately shown in figure 1. Applicant then states that such a feature is a "conventional feature" and need not be illustrated in the figures. If adequately shown, applicant is required to identify the "direct injection of a fuel into a combustion chamber of the internal combustion engine" in the figures in applicant's next response. If it is not shown, applicant's argument of "conventional feature" is moot.

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Convention features may not be required in the drawings for adequate disclosure, but 37 CFR 1.83(a) clearly requires the drawings to show every feature of the invention specified in the claims.

In response to applicant's argument that the flattened face projection of Imafuku et al. does not cover the outlet orifice, The entry plane of the outlet orifice (outlet of orifice 54a,b) is arranged such that the entry plane is completely covered by a projection of the flattened face (downstream end of 45) into the entry plane (projection of downstream end of 45 onto orifice 45 at an angle such that the projection completely covers the orifice).

In response to applicant's argument that Shen et al. does not teach a flattened face projection which covers the outlet orifice, Shen et al. is not relied on for such a teaching.

In the rejection under 35 U.S.C. 103(a) as being unpatentable over Ren et al., applicant alleges that the rejection is improperly based on hindsight because it relies on applicant's disclosed motivation. Applicant have given no motivation for the embodiment disclosed in figure 6 except for that it "may be desirable for certain applications." Applicant discloses a first species, in figures 3-5, in which  $d > D$  and a second species in figure 6 in which  $d < D$ . Ren et al. identifies and defines dimension  $d$  ( $d_r$ ) and  $D$  ( $d_o$ ). It is well within one having ordinary skill in the art to optimize these values dependent on application criteria. *In re Aller*, 105 USPQ 233. Applicant's disclosure of "may be desirable for certain applications" is not being relied on for motivation but rather identified for further evidence.

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In response to applicant's argument Ren et al. does not teach a flattened face projection which covers the outlet orifice, such a condition is inherent when  $d_f > d_o$ .

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher S. Kim whose telephone number is (703) 308-8336. The examiner can normally be reached on Monday - Thursday, 6:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Y. Mar can be reached on (703) 308-2087. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9302 for regular communications and (703) 872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.



Christopher S. Kim  
Primary Examiner  
Art Unit 3752

CK  
August 9, 2003